REMARKS

These amendments and remarks are being filed in response to the Office Action dated December 17, 2004. For the following reasons this application should be allowed and the case passed to issue.

No new matter is introduced by this amendment. The amendments to claims 1 and 7 are supported throughout the specification, including page 5, lines 13-18, page 8, lines 15-24, and claim 2. Claims 3-5 are amended to maintain consistency with claim amended claim 1.

Claims 1 and 3-30 are pending in this application. Claims 1-30 are rejected. Claims 1, 3-5, and 7 have been amended. Claim 2 has been canceled.

Initially, it is noted that the Office Action included initialed copies of the filed Information Disclosure Statements (IDS) (PTO-1449) indicating consideration of most of the references cited therein. The Examiner, however, did not initial the three JIS standards cited in the IDS filed October 17, 2003. The three JIS standards are again cited in an IDS filed concurrently with this amendment and copies of JIS are attached to the IDS for the Examiner's convenience. Applicants respectfully requests that the Examiner considers the JIS standards and initial and return a copy of the concurrently filed IDS.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Hirakawa et al. (U.S. Patent No. 6,012,851). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is comparison between the present invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a full-type rolling bearing formed of an outer ring, an inner ring and rollers that are made of steel. At least one of the outer ring, inner ring and

rollers has a carbonitrided layer in its surface layer, and the austenite crystal grain size number of the surface layer is greater than 10. After at least one of the outer ring, inner ring and rollers is carbonitrided at a carbonitriding temperature equal to or higher than the A1 transformation temperature, the at least one of the outer ring, inner ring, and rollers is cooled to a temperature lower than the A1 transformation temperature and then heated to a quenching temperature lower than the carbonitriding temperature and thereby quenched.

Another aspect of the invention, per claim 7, is a roller cam follower of an engine comprising an outer ring being in rolling contact with a cam shaft of the engine. A roller shaft is located inside the outer ring and fixed to a cam follower body. Bearing elements are placed between the outer ring and the roller shaft. At least one of the outer ring, roller shaft and bearing elements has a carbonitrided layer, and austenite crystal grains in at least a surface layer are made fine to have a grain size number greater than 10. After at least one of the outer ring, roller shaft, and bearing elements is carbonitrided at a carbonitriding temperature equal to or higher than the A1 transformation temperature, the at least one of the outer ring, roller shaft, and bearing elements is cooled to a temperature lower than the A1 transformation temperature and then heated to a quenching temperature lower than the carbonitriding temperature and thereby quenched.

Another aspect of the invention, per claim 8, is a roller cam follower of an engine comprising an outer ring being in rolling contact with a cam shaft of the engine. A roller shaft is located inside the outer ring and fixed to a cam follower body. The bearing elements are placed between the outer ring and the roller shaft. At least one of the outer ring, roller shaft and bearing elements has a carbonitrided layer and has a fracture stress of at least 2650 MPa.

Another aspect of the invention, per claim 9, is a roller cam follower of an engine comprising an outer ring being in rolling contact with a cam shaft of the engine. A roller shaft is located inside the outer ring and fixed to a cam follower body. Bearing elements are placed between the outer ring and the roller shaft. At least one of the outer ring, roller shaft and bearing elements has a carbonitrided layer and has a hydrogen content of at most 0.5 ppm

The Examiner asserted that Hirakawa et al. disclose a full-type rolling bearing wherein at least of one of an outer ring 4, inner ring 3, and steel rollers 5 is carbonitrided and comprises austenite. The Examiner alleged that the austenite crystal grain size number of the surface layer is greater than 10, and that one of rings and rollers has a fracture stress of at least 2650 MPa, a compression stress of at least 500 MPa, and has a hydrogen content of at most 0.5 ppm.

Contrary to the Examiner's assertions, Hirakawa et al. do not disclose a full-type rolling bearing comprising an austenite component with the required crystal grain size formed by the process steps recited in claims 1 and 7. Furthermore, Hirakawa et al. do not disclose a roller cam follower of an engine comprising an outer ring, roller shaft and bearing elements, wherein at least one of the outer ring, roller shaft, and bearings have a fracture stress of at least 2650 MPa, required by claim 8, and a hydrogen content of at most 0.5 ppm, as required by claim 9.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d

1051 (Fed. Cir. 1987). Because Hirakawa et al. do not disclose at a full-type rolling bearing with the austenite component with the required crystal grain size formed by the process steps recited in claims 1 and 7; a roller cam follower of an engine comprising an outer ring, roller shaft and bearing elements, wherein at least one of the outer ring, roller shaft, and bearings have a fracture stress of at least 2650 MPa, required by claim 8; and a hydrogen content of at most 0.5 ppm, as required by claim 9, Hirakawa et al. do not anticipate claims 1, 7, 8, and 9.

Applicants further submit that Hirakawa et al. do not suggest the claimed full-type rolling bearing and roller cam follower of an engine. If the Examiner maintains this rejection, Applicants respectfully request the Examiner to point out, with specificity, where Hirakawa et al. disclose a full-type rolling bearing comprising an austenite component with the required crystal grain size formed by the process steps recited in claims 1 and 7; the cam follower of an engine comprising an outer ring, roller shaft and bearing elements, wherein at least one of the outer ring, roller shaft, and bearings have a fracture stress of at least 2650 MPa, and a hydrogen content of at most 0.5 ppm.

Claim Rejections Under 35 U.S.C. § 103

Claims 10-30 were rejected under 35 U.S.C. 35 § 103(a) as obvious over Hirakawa et al. in view of Schmidt et al. (U.S. Patent No. 5,775,280). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The Examiner averred that Hirakawa et al. substantially disclose the claimed roller cam follower except for the bifurcated rocker arms, cam follower body with two sidewalls, a rocker arm operating an interlocking rod, needle bearings, roller shaft with variable hardness, and a roller shaft with a caulked end. The Examiner maintained that Schmidt et al. teach the claimed

roller cam follower is conventional in the art and that it would have been obvious to use the rocker arm of Schmidt et al. to improve valve timing control.

Claims 10-30 are allowable for at least the same reasons as independent claims 7, 8, and 9, as Schmidt et al. do not cure the deficiencies of Hirakawa et al. Schmidt et al. do not suggest a full-type rolling bearing comrpising an austenite component with the required crystal grain size formed by the process steps recited in claims 1 and 7; and a roller cam follower of an engine comprising an outer ring, roller shaft and bearing elements, wherein at least one of the outer ring, roller shaft, and bearings have a fracture stress of at least 2650 MPa, required by claim 8, and a hydrogen content of at most 0.5 ppm, as required by claim 9.

The dependent claims are allowable for at least the same reasons as the independent claims from which they depend, and further distinguish the claimed invention. For example, Hirakawa et al. do not suggest the residual stress of at least 500 MPa, as required by claim 6. The combination of Hirakawa et al. and Schmidt et al. do not suggest the roller shaft with a variable hardness, as required by claims 22-24, and the roller shaft with its end caulked, as required by claims 25-27.

In view of the above remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Bernard P. Codd
Registration No. 46,429

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 BPC:kap
Facsimile: 202.756.8087
Date: April 18, 2005

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